



# Auto Restart Pump Controller

## iCON NXT Pro User Manual

### 808035 / BIA-NXTPRO



## 1. Introduction

Thank you for choosing the **iCON NXT Pro** Intelligent Pump Controller.

The **iCON NXT Pro** is a DUAL MODE, digital pump pressure controller suitable for controlling single phase pumps up to a maximum of 16 amps (approx. 2.2kW)

When operating in Mode 1, the **iCON NXT Pro** behaves as a traditional pressure controller. It starts the pump by registering water pressure drop and stops the pump when flow through the controller falls sufficiently. The pump start pressure is able to be set by the user.

In Mode 2, the **iCON NXT Pro** behaves as an electronic pressure switch with dry run protection where, the pump operates when water pressure falls below the starting pressure and stops when the upper setting is achieved. Both the start and stop pressure can be selected by the user. (A Pressure Tank is required if operating in Mode 2)

The **iCON NXT Pro** offers a number of other protection and control options to ensure the durability of your pumping system.






## 2. Key Features

- Electrical components are completely isolated from the water flow.
- The Digital display provides real time information of the pressure, the pump current draw and can also indicate visually whether there is flow or no flow.
- Built in pump protections:
  - Dry run sensing and auto restart function when water supply is available
  - Prevents the pump from starting and stopping too often.
  - Over pressure protection
  - User programmable overload protection
  - User programmable Dry Run underload protection
  - Anti-seize function if pump has not operated for the last 24 hours.
  - User programmable maximum pump run time setting.

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## 4. ISO 7010 Symbols used in this manual








	Warning - Electrical safety
	Warning – Potential consequences of use outside of intended application(s). Includes environmental condition warnings.
	Mandatory warning
	Warning to disconnect power
	Read carefully



## 5. Technical specifications

	NXT PRO
Function	On/Off + Configuration
Modes	Mode 1 Pressure Controller Mode 2 Pressure Switch
Pump size	Up to 2.2kW - 240V 1Ph
Input power	80 - 240V 1ph 50Hz Generator compatible
Max Amperage	16 amp
Connection Size	1" BSP Male
Pressure Tank	0.3l removable spring controlled diaphragm tank Internal 1" BSPF thread to connect external pressure vessel once OEM accumulator removed
Pump Start pressure	Default 2.2 bar User adjustable 0.5 - 6.0 bar
Pump stop	Flow less than 0.9 lpm in Mode 1 User adjustable 1.8 - 9.0 bar in Mode 2
Maximum pressure	10 bar. Pressure differential range 0.3 – 8.5 bar
Max ambient air temp	3 - 50°C
Max water temp	3 - 60°C
Maximum flow	Tested to 150 lpm / 9m <sup>3</sup> /hr - 1" outlet Tested to 300 lpm / 18 m <sup>3</sup> /hr - 1 ¼" outlet
Cable to Pump	'Plug and Play' IEC C13/C14 appliance connector. <i>Fly lead supplied when purchased as control only</i>
Power Cable	10 amp
IP Rating	IP65
Accessories (Sold Separately)	15 amp cables
	1 ¼" union kit for flows up to 300 lpm

## 6. Warnings

	Read the manual carefully before starting and retain for future reference.
	Prior to starting installation or maintenance, the controller must be disconnected from the power supply and pressure relieved from the system including controller, pump and associated pipework.
	Any changes or modification to the wiring must be carried out by suitably qualified personnel.
	A qualified electrician should correctly size and install circuit breakers to protect the power supply. The fitment of additional surge protection is recommended.
	Never open the cover while controller is connected to electrical supply.
	This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.
	Never connect AC power to the output terminals. This will cause damage to the controller not covered under warranty.

## 6.1 Cautions

- 6.1.1 Ensure the controller is suitable for the pump (see Section 5. Technical Data).
- 6.1.2 The controller is designed for use with clean water. Contamination including sand or mineral deposits may affect the operation of the controller.
- 6.1.3 Remove any shipping plugs from the suction and discharge ports.
- 6.1.4 There are no serviceable parts in the NXT Pro controller. It should not be dismantled.
- 6.1.5 No regular maintenance of the NXT Pro controller is required.
- 6.1.6 Fitment and replacement must be carried out by competent, skilled and qualified personnel.

6.1.7 Avoid installing the NXT Pro controller where it could experience the following conditions:

- Where there is significant vibration and/or mechanical shock.
- Where it could be exposed to corrosive liquids or gasses, or to flammable materials, solvents etc.
- Extreme heat and cold. Operating range 3°C - 50°C.
- Protect the controller from rain and moisture.



## 7. Electrical Connections

Always use an electrical outlet that is protected by Residual Current Device (RCD) Safety Switch with a trip current of 30mA or less. A Safety switch is required by Australian/New Zealand Standard AU/NZS 60335.1-2011.



If the supply cord is damaged, it must be replaced by a special cord or assembly available from White International Pty Ltd or its service agent.



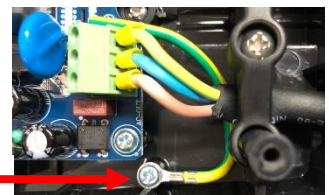
The iCON NXT Pro is supplied with a 10 amp rated lead and AS/NZ 3112 (Type 1) 3 pin male power plug for connecting to mains power.

The 'Plug and Play' version of the iCON NXT Pro is fitted with a 10 amp rated IEC C13 appliance connector.

When the iCON NXT Pro is purchased as CONTROLLER ONLY it is supplied with a 2 core and earth power cable for connection to the pump's electric motor. This must be connected by a suitably qualified technician.

An optional 15 Amp rated power cord kit is available as an accessory.

There is an additional earth wire inside the controller which provides protection in the event of flooding.



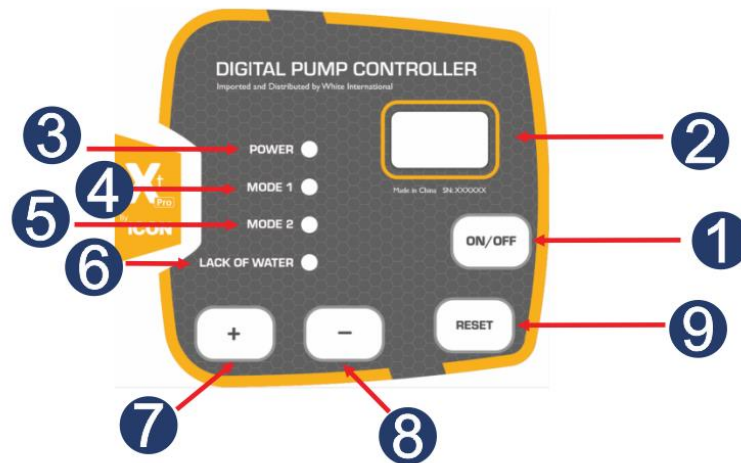
*Additional Earth Connection*



**iCon nXt Pro** internal wiring connections.



## 8. Display



No.	Name	Function
<b>1</b>	ON/OFF	Short button press of ON/OFF turns the pump controller on Press and HOLD ON/OFF button for <b>3 seconds</b> to turn the controller off. Press and Hold ON/OFF for 3 seconds to reset any error messages
<b>2</b>	DIGITAL DISPLAY (RUNNING)	PX.X = Real time pressure in Bar CX.X = Real time current in amps Symbol moving clockwise = Flow (quick press of RESET button 9 to change modes) - - - symbol stationary = No Flow OP displayed = Over pressure protection activated -A- displayed = Frequent start protection active OL flashing = Overload protection setting UL flashing = Underload protection setting PF = Low Flow protection setting Pr = Max run time protection setting
<b>2</b>	DIGITAL DISPLAY (PROGRAMMING)	PX.X = Start and Stop Pressure CX.X = Current F1 = Mode 1 (pressure controller) <i>Default cut in 2.2 bar</i> F2 = Mode 2 (pressure switch) <i>Default cut in 2.2 bar, Default cut out 9 bar</i> OL = Overload protection setting <i>Default setting C0.0</i> UL = Underload protection setting <i>Default setting C0.0</i> PF = Low Flow protection setting <i>Default setting 1 (Enabled)</i> Pr = Maximum run time setting <i>Default setting 000 (Inactive)</i>
<b>3</b>	POWER	<b>GREEN LED POWER constant</b> – Power connected
<b>4</b>	MODE 1	<b>Orange LED MODE 1 constant</b> – pump is in precise control mode
<b>5</b>	MODE 2	<b>Orange LED MODE 2 constant</b> – pump is in precise control mode
<b>6</b>	LACK OF WATER	<b>RED LED flashing</b> - pump short of water <b>RED LED constant</b> - pump awaiting 24 hour restart
<b>7</b>	PLUS	To increase value of parameter ( Located bottom left, marked +)
<b>8</b>	MINUS	To decrease value of parameter ( Located bottom centre, marked -)
<b>9</b>	RESET	To set and save a parameter ( Located bottom right, marked RESET)

## 9. Programming

**Important Note:** The controller allows for a maximum of 10 seconds between button presses when programming. If no button press is detected, after 10 seconds the controller will exit the adjustment state

**POWER**

**RESET** **3"**

**+**

**Mode 1 = Pressure Control**

**F1** **MODE 1** **RESET** **PX.X** **+ or -** **RESET**

Pump Start Pressure

**+**

**Mode 2 = Pressure Switch**

**F2** **MODE 2** **RESET** **PX.X** **+ or -** **RESET** **PX.X** **+ or -** **RESET**

Pump Start Pressure Pump Stop Pressure

**+**

**OL** **RESET** **CX.X** **+ or -** **RESET**

Overload Current - Adjustment range C15 - C50 (15 - 50 amps)

**+**

**UL** **RESET** **CX.X** **+ or -** **RESET**

Underload Current - Adjustment range C0.5 - C10 (0.5 - 10 amps)

**+**

**PF** **RESET** **1** **+ or -** **0** **RESET**

Low Flow Protection. Default 1 = Enabled 0 = Disabled (for low flow applications)  
When PF is disabled UL MUST be set to provide dry run protection

**+**

**Pr** **RESET** **000** **+ or -** **XXX** **RESET**

Maximum run time. Default 000 = Disabled Select 30,60,90,120,150,180,210,240 minutes

### ERROR MESSAGES

To reset the controller, Press and Hold the **ON/OFF** button for 3 sec  
OR cycle the power to the controller

**OP** Pressure on the control has exceeded 9.9 bar for more than 5 seconds Pump will attempt restart in 30 minutes.

**-A-** Pump has started for less than 30 seconds for the last 15 starts. Pump will attempt restart in 30 minutes.

**OL** Overload condition active. Pump will shut down and prevent operation until a controller reset is performed.

**UL** Underload (Dry run) condition active. Pump will enter an AUTO RESTART CYCLE  
The **RED** LACK OF WATER LED will FLASH **LACK OF WATER**   
If awaiting the 24Hr restart, The **RED** LACK OF WATER LED is STEADY **LACK OF WATER**

**Pr** Maximum run time exceeded. Controller has stopped the pump.

## 10. Installation



Review SECTION 6 and 6.1 (Warnings and Cautions) prior to installing

Direction of flow is indicated by an arrow on the inlet and outlet.

Note that the controller has been designed to work with clean water.

Avoid any debris in the pipeline and controller to prevent failure.

The controller can be installed in any orientation so long as the direction of flow is respected.

Ensure maximum static head (pressure) of water above the controller is less than the starting (cut in) pressure, otherwise the pump will not start. See table below.



The controller is to be installed on the discharge of the pump prior to any outlets/taps.

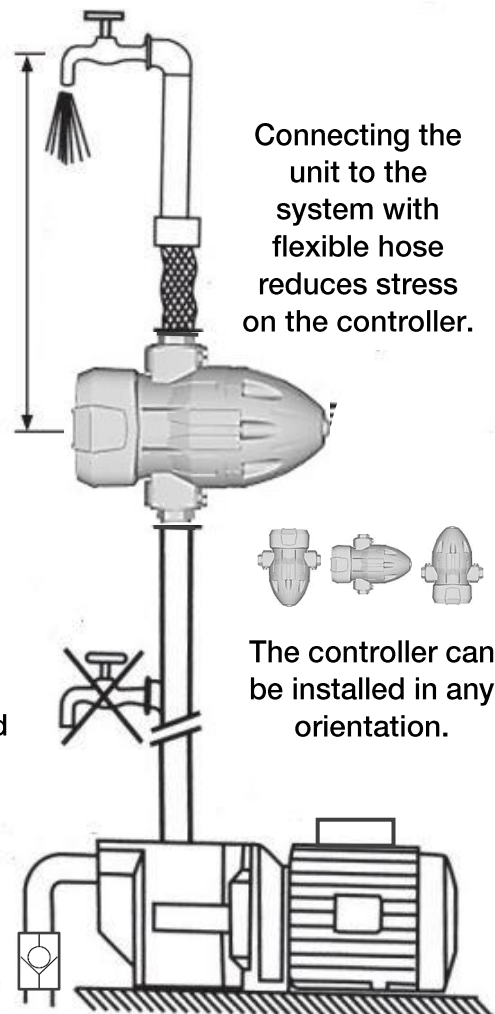
*Installation of the controller must be performed by a suitably qualified technician.*

The maximum pressure (static head) of water above the controller must be less than the starting (cut in) pressure selected, otherwise the pump will not start.

Cut in Pressure	Maximum static head
1.0 bar	Less than 5m
2.0 bar	Less than 15m
3.0 bar	Less than 25m
4.0 bar	Less than 35m
5.0 bar	Less than 45m
6.0 bar	Less than 55m

NO water can be drawn off between the pump outlet and the control unit.

Fit a non-return valve on the inlet line to prevent pressure loss back through the intake.



## 11. Priming the system

The iCON NXT Pro is supplied with two 1" BSPT male swivel unions.

The controller can be removed from the pump by removing the stainless steel retaining clip. Once the clip is removed the connection fitting will slide from the controller body.



**Due to the non-return mechanism inside the controller, the pump should be primed before fitting the controller OR filled through the pump priming port.**

## 12. Standards and Approvals



**SAA Approvals** is accredited by the Joint Accreditation Service of Australia and New Zealand (JAS-ANZ) as a third party certification body to issue of Certificates of Approval for declared and non-declared electrical equipment that has proven to comply with the safety requirements of the applicable Australian Standard.



Pumps that carry the **AS/NZ4020 Drinking Water Approval** demonstrate compliance with requirements of Australia & New Zealand Standards of products that come into contact with water intended for human consumption. This approval also ensures that the water coming from the pump will not be contaminated by toxic materials or metals. It also means the water will not support the growth of micro-organisms and will not cause a change in taste or appearance.



**CE marking** is a certification mark that indicates conformity with health, safety and environment. The CE marketing represents a manufacturer's declaration that products comply with the EU's New Approach Directives. These directives not only apply to products within the EU but also for products that are manufactured in or designed to be sold in the EEA.

## 13. Operation

The iCON NXT PRO factory default setting is Mode 1, Cut in pressure of 2.2 bar.

*No adjustment is required if replacing a standard Auto Restart Pump Controller.*

When the unit is connected to a power supply the **GREEN** LED "Power On" lights up, the display illuminates and an orange LED will illuminate to indicate the mode selected.

- Press ON/OFF button and the controller will supply power to the pump
- Press and Hold the ON/OFF button for 3 seconds to switch the controller off  
The Display will read OFF

On initial priming the controller may time out on 'dry run' and the **RED** LED "LACK OF WATER" will illuminate. To reset, press and Hold the "ON/OFF" button for 3 sec.

### Mode 1 – Electronic Pressure Controller

The iCon NXT Pro controller will start the pump automatically when the pressure falls under the Cut In pressure. See Programming sequence: Section 9

Mode 1 default Cut In pressure = 2.2 bar

Set to Mode 1, the iCon NXT Pro controller will stop the pump for 4 reasons:

- Once flow has stopped due to a tap being closed
- In the event that the pump has run out of water
- If the control is subject to over-pressure or frequent starts
- If the controller should operate outside of any user programmed parameters

### Mode 2 – Electronic Pressure switch

The Mode 2 default settings are: Cut In pressure 2.2 bar, Cut Out pressure 4.0 bar.

Operation in Mode 2 (pressure switch) requires the fitment of a pressure tank.  
**Pressure Tank pre-charge recommendation = 66% of the cut out pressure.**



The Cut In and Cut Out pressure must be adjusted prior to operation

Programming sequence: Section 9



**The Cut Out pressure MUST be set 0.3 – 0.5 bar less than the pump maximum pressure to enable the pump to turn off properly.**

If the *PF Pump Low Flow Protection* is disabled and the Cut Out pressure is set higher than the pump can deliver the controller will not switch off at all.

With the Pump low flow protection disabled the UL underload setting becomes the only form of dry run protection and should be adjusted carefully.

## 13. Operation continued

- Display of OP** Occurs when pressure on the control exceeds 9.9 bar for more than 5 seconds. Pump will attempt restart in 30 minutes.
- Display of -A-** Occurs when Pump has cut in and cut out at intervals less than 30 seconds for the last 15 starts. Pump will attempt restart in 30 minutes.
- Display flashing OL** The controller has sensed an overload condition exceeding the programmed value. The pump will shut down until a manual system reset occurs.  
Press and Hold ON/OFF for 3 seconds. Then press ON/OFF.
- Display flashing UL** An underload (dry run) condition outside of the programmed value has occurred. The Auto Restart Cycle will commence and the **RED LED LACK OF WATER** will flash.
- Display flashing Pr** The controller has shut down because the maximum run time has been exceeded.

Pushing the RESET button rotates the display indication.

System Pressure / Current Draw / Operational Status.



**Underload / Dry Run condition** – assumes the Pipe Flow parameter PF is enabled.

The following applies to both Mode 1 and Mode 2 See Programming sequence: [Section 9](#)

If there is no water in the tank or a closed supply/suction pipe issue, the iCon NXT Pro controller will allow the pump to run for 20 seconds with no flow detected before shutting down.

The **RED LED, LACK OF WATER** will **FLASH** and the following sequence will run:

- Stop for 10 seconds,
- Run for 40 seconds, Stop for 10 seconds
- Run for 40 seconds, Stop for 10 seconds.

LACK OF WATER

After this sequence, the controller will go into auto restart mode and the **RED LED, LACK OF WATER** will stay **ON AND STEADY**

LACK OF WATER

The controller will repeat this sequence every 24 hours until flow is detected.

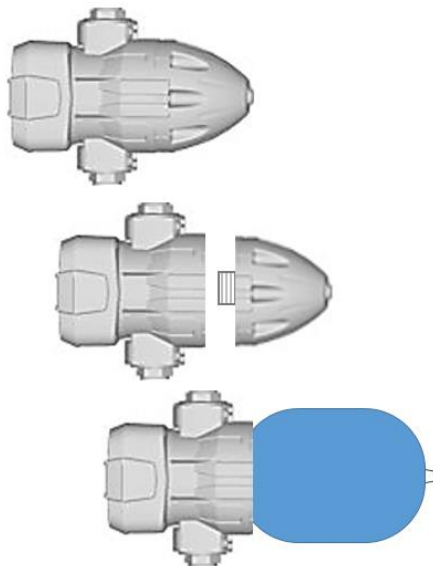
To clear any fault or to resume normal operation perform one of the following

- Press and hold ON/OFF for 3 seconds
- Cycle the power to the controller



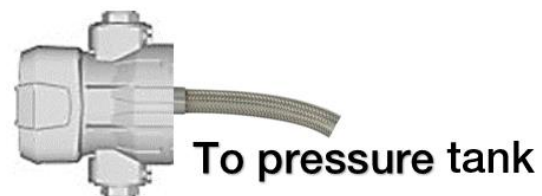
## 14. NXT Pro and pressure tank fitment

The nXt Pro controller behaves as a pressure controller in Mode 1 and as a pressure switch in Mode 2



As supplied, the controller has a 0.3 litre pressure accumulator threaded onto the rear of the unit. Removing the OEM tank exposes an internal 1" BSPF thread which allows the user to thread a 2l pressure vessel directly to the controller or to connect larger pressure vessels via a flexible hose.

Maximum size for direct fitment – 2 litre



### Mode 1

A pressure controller minimises pump cycling by keeping the pump running until the flow drops below 0.9 lpm so it cannot be said that a pressure vessel is essential.

Most systems suffer from small water losses (dripping taps, leaking cisterns, feeding low demand items such as ice makers or Reverse Osmosis filtration units) **the addition of a 2, 8 or 18 litre tank is strongly encouraged**

Fitting a pressure tank will reduce the number of pump starts giving a number of benefits:

- Power saving (reduced power bill!)
- Longer pump life
- Reduced noise

### Mode 2

As with all pressure switches, **a suitably sized pressure vessel MUST be added to the system to prevent the pump from cycling.**

Typically surface mounted pumps up to 2.2kW should start less than 30 times per hour.

Pressure tanks should never hold more than 1/3 of their total volume as water.

Manufacturer's recommend the gas pressure in the tank to be 66% of the maximum system pressure.

		CUT IN PRESSURE							
		1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
CUT OUT PRESSURE	2.5	1.30	1.80	Green cells - precharge is 20kpa below cut in pressure					
	3.0	1.66	1.80	2.30	Blue cells - precharge is 66.6% of cut out pressure				
	3.5	2	1.80	2.30	2.80				
	4.0	2.33	2.33	2.33	2.80	3.30			
	4.5	2.66	2.66	2.66	2.80	3.30	3.80		
	5.0	3	3	3	2.80	3.30	3.80	4.30	
	5.5	3.33	3.33	3.33	3.33	3.30	3.80	4.30	4.80
	6.0				3.66	3.66	3.66	3.80	4.30
	6.5				4	4	4	4	4.30
	7.0				4.33	4.33	4.33	4.33	4.33
	8.0				4.99	4.99	4.99	4.99	4.99
	9.0				5.66	5.66	5.66	5.66	5.66

## 15. Warranties – Terms and Conditions

This warranty is given in addition to the consumer guarantees found within the Australian Competition and Consumer Act 2010 (Cth) for goods purchased in Australia and the Consumer Guarantees Act 1993 NZ for goods purchased in New Zealand:



1) White International Pty Ltd / White International NZ Ltd (White International) warrant that all products distributed are free from defects in workmanship and materials, for their provided warranty period as indicated on the top or opposite side of this document. Subject to the conditions of the warranty, White International will repair any defective products free of charge at the premises of our authorised service agents throughout Australia and New Zealand if a defect in the product appears during the warranty period. If you believe that you have purchased a defective product and wish to make a claim under this warranty, contact us on our Sales Hotline on 1300 783 601, or send your claim to our postal address or fax line below and we will advise you as to how next to proceed. You will be required to supply a copy of your proof of purchase to make a claim under this warranty.

2) This warranty excludes transportation costs to and from White International or its appointed service agents and excludes defects due to non-compliance with installation instructions, neglect or misuse, inadequate protection against the elements, low voltage or use or operation for purposes other than those for which they were designed. For further information regarding the suitability of your intended application contact us on our Sales Hotline on 1300 783 601. If you make an invalid claim under this warranty, the original product will be sent back to you unrepaid.

3) This warranty refers only to products sold after the 1st January 2012, and is not transferable to another product type and only applies to the original owner, purchaser or end user, and is in addition to the consumer guarantees found within the Competition and Consumer Act 2010 (Cth) for goods purchased in Australia and the Consumer Guarantees Act 1993 (NZ) for goods purchased in New Zealand.

4) Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. 2 YEAR WARRANTY

5) To the fullest extent permitted by law, White International excludes its liability for all other conditions or warranties which would or might otherwise be implied at law. To the fullest extent permitted by law, White International's liability under this warranty and any other conditions, guarantees or warranties at law that cannot be excluded, including those in the Competition and Consumer Act 2010 (Cth), is expressly limited to: (a) in the case of products, the replacement of the product or the supply of equivalent product, the payment of the cost of replacing the product or of acquiring an equivalent product or the repair of the product or payment of the cost of having the product repaired, is at the discretion of White International or a 3rd party tribunal elected under the Competition and Consumer Act 2010 (Cth) for goods purchased in Australia and the Consumer Guarantees Act 1993 (NZ) for goods purchased in New Zealand; and

6) To the fullest extent permitted by law, this warranty supersedes all other warranties attached to the product or its packaging.

7) In the case of services, supplying the services again or the payment of the cost of having the services supplied again, is at the discretion of White International or a 3rd party tribunal elected under the Competition and Consumer Act 2010 (Cth) for goods purchased in Australia and the Consumer Guarantees Act 1993 (NZ) for goods purchased in New Zealand. 8) Our warranty commences from the date of purchase of the above mentioned pumps. Proof of purchase is required before consideration under warranty is given.

*Record your date of purchase in the space below and retain this copy for your records.*

**Date of Purchase .....****Model Purchased .....**



## 16. Trouble Shooting Guide

	Causes unrelated to the controller	Unit related causes
The pump will not start	<ol style="list-style-type: none"> <li>1. Voltage Failure Is the <b>GREEN LED 'POWER'</b> illuminated?</li> <li>2. Pump no longer operational.</li> <li>3. Wiring inverted (line/motor)</li> </ol>	<ol style="list-style-type: none"> <li>1. Ensure the controller ON/OFF button is ON.</li> <li>2. Check the controller isn't in error mode with the <b>RED LED 'LACK OF WATER'</b> illuminated or the display showing -P-, -A-, OL, UL, PF or Pr</li> <li>3. <i>Controller Only option:</i> check the controller to pump wiring.</li> <li>4. Ensure the water column above the controller isn't greater than the cut in pressure.</li> <li>5. Internal electronics may have failed due to a lightning strike or power surge</li> </ol>
The pump doesn't stop	<ol style="list-style-type: none"> <li>1. There may be leaks greater than the minimum flow requirement. (nominal 0.9 l/min) <i>Note: Check discharge and intake for losses</i></li> </ol>	<ol style="list-style-type: none"> <li>1. PF (low flow protection) setting may be disabled</li> <li>2. Inspect the internal check valve</li> <li>3. Excessive iron oxide disrupting operation</li> <li>4. Internal electronics may be damaged</li> </ol>
Pump Failure	<ol style="list-style-type: none"> <li>1. Water failure</li> <li>2. Suction problems</li> </ol>	<i>Pump failure is not necessarily the fault of the controller</i>
<b>RED LED 'LACK OF WATER'</b> Flashing	<ol style="list-style-type: none"> <li>1. Pump not primed or has lost prime</li> <li>2. Water shortage. Valve on suction closed?</li> <li>3. Air pockets or leaks in the suction line</li> <li>4. Pump thermal protection activated</li> <li>5. Pump head less than cut in pressure.</li> </ol>	
Display OP	The actual pressure in the pipeline has been more than 9.9 Bar for longer than 5 seconds	<ol style="list-style-type: none"> <li>1. The controller may be damaged</li> <li>2. The pressure sensor may be damaged</li> </ol>
Display -A-	Check for leaking taps, float valves, or non-return valves/foot valves	<b>For the last 15 times the pump has run for less than 30 sec</b>
Display OL	Possible pump fault	Indicates Power Overload Check the OL set value is correct
Display UL	Lack of water (dry run)	Indicates Power Underload Check the UL set value is correct
Display Pr	Tap left open or broken pipe	Pump has been running continuously, exceeding time value of Pr setting. Cut-out pressure (Mode 2) is greater than the pump can deliver. Reset by cycling power to controller.

## 17. Notes

## 18. Notes



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**[www.whiteint.co.nz](http://www.whiteint.co.nz)**

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**Please always refer to our website for further technical information & new product innovations**

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